

Amendments to the Claims

Claim 1 (**Currently Amended**) A remote maintenance system comprising:

a center server ~~that~~ is located in a service center for performing maintenance of an electrical appliance; and

a home server ~~that~~ is located in ~~each~~ a house ~~and monitors~~ for monitoring a status of an electrical appliance in ~~a~~ the house,

wherein the center server and the home server are connected via a communication line,
the home server includes:

a status value acquiring unit operable to acquire a status value of ~~each~~ the electrical appliance;

a failure model receiving unit operable to receive from the center server a failure model ~~which~~
~~is information defining a method~~ for deriving a decision as to whether or not the electrical appliance
is has failed ~~or not~~ from the status value; and

a failure deciding unit operable to decide whether or not the electrical appliance is has failed
~~or not~~ based on the acquired status value and the received failure ~~model using qualitative reasoning,~~
model, and

the center server includes a failure model updating unit operable to update the failure model
and send the updated failure model to the home server.

Claim 2 (**Currently Amended**) The remote maintenance system according to Claim 1,
wherein the home server further includes:

a status value storing unit operable to store a the status value at ~~the~~ a time when the failure
deciding unit decides that the electrical appliance is has failed or not failed; and

a status value sending unit operable to send the stored status value to the center server,

the center server further includes a status value receiving unit operable to receive the status
value from the home server, and

the failure model updating unit updates the failure model based on the received status value
of the electrical appliance.

Claim 3 (**Original**) The remote maintenance system according to Claim 2,
wherein the failure model includes a standard value indicating a decision basis for the failure
deciding unit to make the decision.

Claim 4 (**Currently Amended**) The remote maintenance system according to Claim 3,
wherein the failure model includes a ~~program for having~~ program, and
the failure deciding unit uses the program to decide whether or not the electrical appliance
is has failed ~~or not~~ using the standard value and the status value.

Claim 5 (**Original**) The remote maintenance system according to Claim 4,
wherein the failure model updating unit updates the standard value using a vector quantization
method based on the status value.

Claim 6 (**Original**) The remote maintenance system according to Claim 5,
wherein the standard value indicates a normal range of a relationship between the status value
stored in the status value storing unit and a preset condition of the electrical appliance at the time
when the status value is acquired.

Claim 7 (**Currently Amended**) The remote maintenance system according to Claim 6,
wherein when the electrical appliance is an air conditioner, the standard value of the failure
model for ~~an~~ the air conditioner includes an upper limit value of a compressor rotational frequency
during a cooling operation and a heating operation of ~~an~~ the air conditioner, and
the failure deciding unit decides that ~~an~~ the air conditioner is has failed when ~~a~~ the compressor
rotational frequency during the cooling operation or the heating operation of the air conditioner
exceeds the upper limit value.

Claim 8 (**Original**) The remote maintenance system according to Claim 6,
wherein the standard value includes a coefficient of a curve indicating a boundary between a normal range and an abnormal range when a pair of the status value and the preset condition is plotted on a multi-dimensional coordinate.

Claim 9 (**Currently Amended**) The remote maintenance system according to Claim 8,
wherein the failure model updating unit updates the coefficient of a the curve by a least squares method based on a plurality of points indicating pairs of ~~the~~ status values and ~~the~~ preset conditions on the multi-dimensional coordinate.

Claim 10 (**Currently Amended**) The remote maintenance system according to Claim 8,
wherein ~~the standard value includes a coefficient of a curve indicating a boundary between a normal range and an abnormal range on the coordinate,~~ when an applicable the electrical appliance is an air conditioner, the preset condition is a temperature difference between a preset temperature and a room temperature during a cooling operation or a heating operation of the air conditioner, and the status value is a lapsed time until the room temperature reaches the preset temperature.

Claim 11 (**Currently Amended**) The remote maintenance system according to Claim 8,
wherein the ~~program is a program for having~~ the failure deciding unit uses the program to decide whether or not the electrical appliance has failed by deciding whether a ~~the~~ point indicating the pair of the preset condition and the status value on the multi-dimensional coordinate is located within the normal range of the curve.

Claim 12 (**Currently Amended**) The remote maintenance system according to Claim 11,
wherein the failure model includes ~~a program~~ another program, and for having
the status value acquiring unit uses the other program to acquire a predetermined status value at a predetermined timing.

Claim 13 (**Currently Amended**) The remote maintenance system according to Claim 12, wherein the home server further includes a customer display unit operable to display customer failure information of the electrical appliance,

the failure deciding unit sends information specifying contents of a failure of the electrical appliance to the center server when the failure deciding unit decides that the electrical appliance is has failed, and

the center server further includes:

a holding unit operable to hold different contents of failure information which are prepared beforehand for a customer and a serviceman separately corresponding to a failure which can occur per model of ~~the~~ electrical appliance;

a failure information sending unit operable to receive the information specifying contents of ~~a~~ the failure of the electrical appliance, specify failure information for a customer among the contents of failure information held in the holding unit, and send the specified customer failure information to the home server; and

a serviceman display unit operable to receive the information specifying contents of ~~a~~ the failure of the electrical appliance, specify failure information for a serviceman among the contents of failure information held in the holding unit, and display the specified serviceman failure information for a serviceman.

Claim 14 (**Currently Amended**) The remote maintenance system according to Claim 13, wherein the failure model receiving unit receives the failure model corresponding to ~~each of~~ the electrical appliance from the center server,

the failure deciding unit decides a failure of the electrical appliance according to the failure model corresponding to ~~each of~~ the electrical appliance, and

the failure model updating unit sends to the home server the updated failure model with an indication of the corresponding electrical appliance which ~~is~~ has been decided ~~to be~~ as having failed.

Claim 15 (**Currently Amended**) The remote maintenance system according to Claim 14, wherein the home server further includes:

a new electrical appliance detecting unit operable to detect an electrical appliance which is newly connected to the home server; and

a failure model requesting unit operable to request the center server to send ~~the~~ a failure model corresponding to the new electrical appliance when the new electrical appliance is detected, the failure model receiving unit receives the requested failure model, and

the failure deciding unit decides whether or not the new electrical appliance is has failed ~~or not~~ using the received failure model.

Claim 16 (**Currently Amended**) The remote maintenance system according to Claim 13, wherein the home server further includes a failure model holding unit operable to hold a failure model ~~per~~ for each model of ~~the~~ electrical appliance ~~which is~~ located in ~~each~~ the house, and the failure deciding unit decides whether or not ~~the~~ an electrical appliance has ~~of a same model~~ is failed ~~or not~~ using a ~~same~~ corresponding failure model.

Claim 17 (**Currently Amended**) The remote maintenance system according to Claim ~~16~~ 16,

wherein the center server further includes:

an appliance information holding unit operable to hold information regarding each house of one or more customers having a maintenance contract with the service center for an electric appliance in which the ~~an~~ electrical appliance ~~which is located in each house of a customer who makes a maintenance contract of the electrical appliance with the service center;~~ located; and

a failure model distributing unit operable to specify a each house ~~where an~~ having the electrical appliance ~~of a model~~ corresponding to the updated failure model by referring to the information held in the appliance information holding unit, and distribute the updated failure model to the home server of each specified house.

Claim 18 (**Currently Amended**) A remote maintenance system comprising:

a center server ~~that is~~ located in a service center for performing maintenance of an electrical appliance; and

a home server ~~that is~~ located in ~~each~~ a house ~~and monitors~~ for monitoring a status of an electrical appliance in a the house,

wherein the center server and the home server are connected via a communication line,
the home server includes:

a status value acquiring unit operable to acquire a status value of ~~each~~ the electrical appliance;

a failure model receiving unit operable to receive from the center server a failure model ~~which is information defining a method~~ for deriving a decision as to whether or not the electrical appliance ~~is~~ has failed ~~or not~~ from the status value;

a failure deciding unit operable to decide whether or not the electrical appliance ~~is~~ has failed ~~or not~~ based on the acquired status value and the received failure model ~~using qualitative reasoning;~~ model; and

a failure model updating unit operable to update the failure model based on the status value of the electrical appliance,

wherein the failure deciding unit further decides whether or not the electrical appliance ~~is~~ has failed ~~or not~~ based on the acquired status value and the updated failure model ~~using qualitative reasoning.~~

Claim 19 (**Original**) The remote maintenance system according to Claim 18,
wherein the failure model includes a standard value indicating a decision basis for the failure deciding unit to make the decision.

Claim 20 (**Currently Amended**) The remote maintenance system according to Claim 19,
wherein the failure model includes a ~~program for having~~ program; and
the failure deciding unit uses the program to decide whether or not the electrical appliance ~~is~~ has failed ~~or not~~ using the status value and the standard value.

Claim 21 (**Original**) The remote maintenance system according to Claim 20,
wherein the failure model updating unit updates the standard value based on the status value using a vector quantization method.

Claim 22 (**Currently Amended**) The remote maintenance system according to Claim 21, wherein the home server further includes a status value ~~memorizing~~ storing unit operable to ~~memorize~~ store the status value at ~~the~~ a time when the failure deciding unit decides that the electrical appliance is has not failed,

the standard value is a coefficient of a primary curve indicating a standard of a normal range when a pair of the status value ~~memorized~~ stored in the status value ~~memorizing~~ storing unit and a preset condition at the time when the status value is acquired is plotted on a two-dimensional coordinate, and

the failure model updating unit updates ~~a~~ the coefficient of the primary curve by a least squares method based on a point indicating the status value and the preset condition on the two-dimensional coordinate.

Claim 23 (**Currently Amended**) The remote maintenance system according to Claim 22, wherein the failure model includes ~~a program for having~~ another program, and the status value acquiring unit uses the other program to acquire a predetermined status value at a predetermined timing.

Claim 24 (**Currently Amended**) The remote maintenance system according to Claim 23, wherein the home server further includes a customer display unit operable to display customer failure information of the electrical appliance,

the failure deciding unit sends information specifying contents of a failure of the electrical appliance to the center server when the failure deciding unit decides that the electrical appliance is has failed, and

the center server further includes:

a holding unit operable to hold different contents of failure information which are prepared beforehand for a customer and a serviceman separately corresponding to a failure which can occur per model of ~~the~~ electrical appliance;

a failure information sending unit operable to receive the information specifying contents of ~~a~~ the failure of the electrical appliance, specify failure information for a customer among ~~the~~ contents

of failure information held in the holding unit, and send the specified customer failure information to the home server; and

a serviceman display unit operable to receive the information specifying contents of a the failure of the electrical appliance, specify failure information for a serviceman among the contents of failure information held in the holding unit, and display the specified serviceman failure information for a serviceman.

Claim 25 (**Currently Amended**) A remote maintenance method for a remote maintenance system ~~comprising:~~ having a center server ~~that is~~ located in a service center for performing maintenance of an electrical appliance, ~~appliance~~; and a home server ~~that is~~ located in ~~each~~ a house ~~and monitors for monitoring~~ a status of an electrical appliance in a the house, wherein the center server and the home server are connected via a communication line, the remote maintenance method comprising:

~~the home server includes:~~

receiving, at the home server ~~a failure model receiving step for receiving~~ from the center server server, a failure model ~~which is information defining a method for deriving a decision as to whether or not an electrical appliance is has failed or not from a status value of each of the electrical appliance;~~

acquiring, at the home server, ~~a status value acquiring step for acquiring~~ the status value;

deciding, at the home server, ~~a failure deciding step for deciding~~ a failure of ~~an~~ the electrical appliance based on the acquired status value and the received failure model ~~using qualitative reasoning; and~~

sending, from the home server, ~~a status value sending step for sending~~ the acquired status value to the center ~~server, and~~ server;

~~the center server includes:~~

receiving, at the center server, ~~a status value receiving step for receiving~~ the status value from the home server; and

~~updating, at the center server, a failure model updating step for updating the failure model based on the received status value of the electrical appliance appliance, and sending the updated failure model to the home server.~~

Claim 26 (**Currently Amended**) The remote maintenance method according to Claim 25, wherein ~~the failure~~ the deciding step of the failure further includes ~~a specific information sending step for sending information specifying contents of a~~ the failure of an the electrical appliance to the center server when it is decided that the electrical appliance is has failed, and the remote maintenance method further comprises:

~~the center server further includes:~~

~~receiving, at the center server, a specifying step for receiving the information specifying contents of a~~ the failure of an the electrical appliance, and specifying failure information for a customer and a serviceman in the holding unit;

~~reading out, at the center server, a failure information sending step for reading out the specified~~ customer failure information for a customer from the holding unit that holds different contents of failure information which are prepared beforehand for a customer and a serviceman separately corresponding to a failure which can occur per model of ~~an~~ electrical appliance, and sending the specified customer failure information for a customer to the home server; and

~~reading out, at the center server, a serviceman displaying step for reading out the specified~~ serviceman failure information for a serviceman from the holding unit, and displaying the read-out serviceman failure information for a ~~serviceman~~, serviceman; and

~~displaying, at the home server, the home server further includes a customer displaying step for displaying the received~~ customer failure information for a customer.

Claim 27 (**Currently Amended**) The remote maintenance method according to Claim 25, wherein ~~the home server further includes:~~ further comprising:

~~detecting, at the home server, a new electrical appliance detecting step for detecting an electrical appliance which is newly connected to the home server; and~~

~~requesting, at the home server, a failure model requesting step for requesting~~ the center server to send ~~the a~~ a failure model corresponding to the new electrical appliance when the new electrical appliance is detected, ~~and wherein~~

the failure model requested in ~~the failure model~~ the requesting step of the failure model corresponding to the new electrical appliance is received in ~~the failure model~~ the receiving step of the failure model.

Claim 28 (**Currently Amended**) A home server ~~that is connected~~ for connection via a communication line with a center server which is located in a service center for performing maintenance of an electrical appliance, and ~~monitors~~ for monitoring a status of an electrical appliance in ~~each a~~ a house, the home server comprising:

a status value acquiring unit operable to acquire a status value of ~~each an~~ an electrical appliance;
a failure model receiving unit operable to receive from the center server a failure model ~~which is information defining a method for deriving a decision as to whether or not~~ the electrical appliance is has failed ~~or not~~ from the status value; and

a failure deciding unit operable to decide whether or not the electrical appliance is has failed ~~or not~~ based on the acquired status value and the received failure model ~~using qualitative reasoning,~~

wherein the failure deciding unit decides whether or not the electrical appliance is has failed ~~or not~~ according to an updated failure model after the failure deciding unit receives the updated failure model from the center server.

Claim 29 (**Currently Amended**) The home server according to Claim 28, further comprising:
a status value storing unit operable to store a the status value at ~~the a~~ a time when the failure deciding unit decides that the electrical appliance is has failed or not failed; and

a status value sending unit operable to send the stored status value to the center server,
wherein the failure deciding unit makes the decision according to the updated failure model using the status value which is sent from the status value sending unit.

Claim 30 (**Currently Amended**) The ~~remote maintenance system~~ home server according to Claim 29,

wherein the failure model includes a standard value indicating a decision basis for the failure deciding unit to make the decision.

Claim 31 (**Currently Amended**) The ~~remote maintenance system~~ home server according to Claim 30,

wherein the failure model includes a ~~program for having program, and~~
the failure deciding unit uses the program to decide whether or not the electrical appliance is has failed ~~or not~~ using the standard value and the status value.

Claim 32 (**Currently Amended**) The ~~remote maintenance system~~ home server according to Claim 31,

wherein the standard value indicates a normal range of a relationship between the status value stored in the status value storing unit and a preset condition of the electrical appliance at the time when the status value is acquired.

Claim 33 (**Currently Amended**) The ~~remote maintenance system~~ home server according to Claim 32,

wherein the standard value includes a coefficient of a curve indicating a boundary between a normal range and an abnormal range when a pair of the status value and the preset condition is plotted on a multi-dimensional coordinate.

Claim 34 (**Currently Amended**) The ~~remote maintenance system~~ home server according to Claim 33,

wherein the failure model receiving unit receives the failure model corresponding to ~~each of~~ the electrical appliance from the center server, and

the failure deciding unit decides a failure of the electrical appliance according to the failure model corresponding to ~~each of~~ the electrical appliance.

Claim 35 (**Currently Amended**) A center server ~~that is connected~~ for connection with a home server for monitoring a status of an electrical appliance in ~~each~~ a house via a communication line, ~~and is the center server being~~ located in a service center for performing maintenance of an electrical appliance, the center server comprising:

a status value receiving unit operable to receive from the home server a status value, a value of ~~each~~ an electrical appliance at ~~the~~ a time when it is decided that the electrical appliance is has failed or not failed, which is stored in the home server; and

a failure model updating unit operable to update a failure model ~~that is information defining a method~~ for deriving a decision as to whether or not the electrical appliance is has failed ~~or not~~ from the status value based on the received status value of the electrical appliance, and send the updated failure model to the home server.

Claim 36 (**Currently Amended**) A program for a home server ~~which is~~ connected with a center server which is located in a service center for performing maintenance of an electrical appliance via a communication line, ~~and monitors the home server for monitoring~~ a status of an electrical appliance in ~~each~~ a house, the program ~~for having a computer function as:~~ comprising:

a status value acquiring ~~unit~~ program portion operable to allow the home server to acquire a status value of ~~each~~ an electrical appliance;

a failure model receiving ~~unit~~ program portion operable to allow the home server to receive from the center server a failure model ~~which is information defining a method~~ for deriving a decision as to whether or not the electrical appliance is has failed ~~or not~~ from the status value; and

a failure deciding ~~unit~~ program portion operable to allow the home server to decide whether or not the electrical appliance is has failed ~~or not~~ based on the acquired status value and the received failure model ~~using qualitative reasoning,~~

wherein the failure deciding ~~unit decides~~ program portion allows the home server to decide whether or not the electrical appliance is has failed ~~or not~~ according to the updated failure model after the failure deciding ~~unit receives~~ program portion allows the home server to receive the updated failure model from the center server.

Claim 37 (**Currently Amended**) A program for a center server which is connected with a home server for monitoring a status of an electrical appliance in ~~each~~ a house via a communication line, ~~and is the center server being~~ located in a service center for performing maintenance of an electrical appliance, the program ~~for having a computer function as:~~ comprising:

a status value receiving ~~unit~~ program portion operable to allow the center server to receive from the home server a status value, a value of ~~each~~ an electrical appliance at ~~the~~ a time when ~~it is~~ decided that the electrical appliance ~~is~~ has failed or not failed, which is stored in the home server; and

a failure model updating ~~unit~~ program portion operable to allow the center server to update a failure model ~~which is information defining a method for deriving a decision~~ as to whether or not the electrical appliance ~~is~~ has failed ~~or not~~ from the status value based on the received status value of the electrical appliance, and send the updated failure model to the home server.